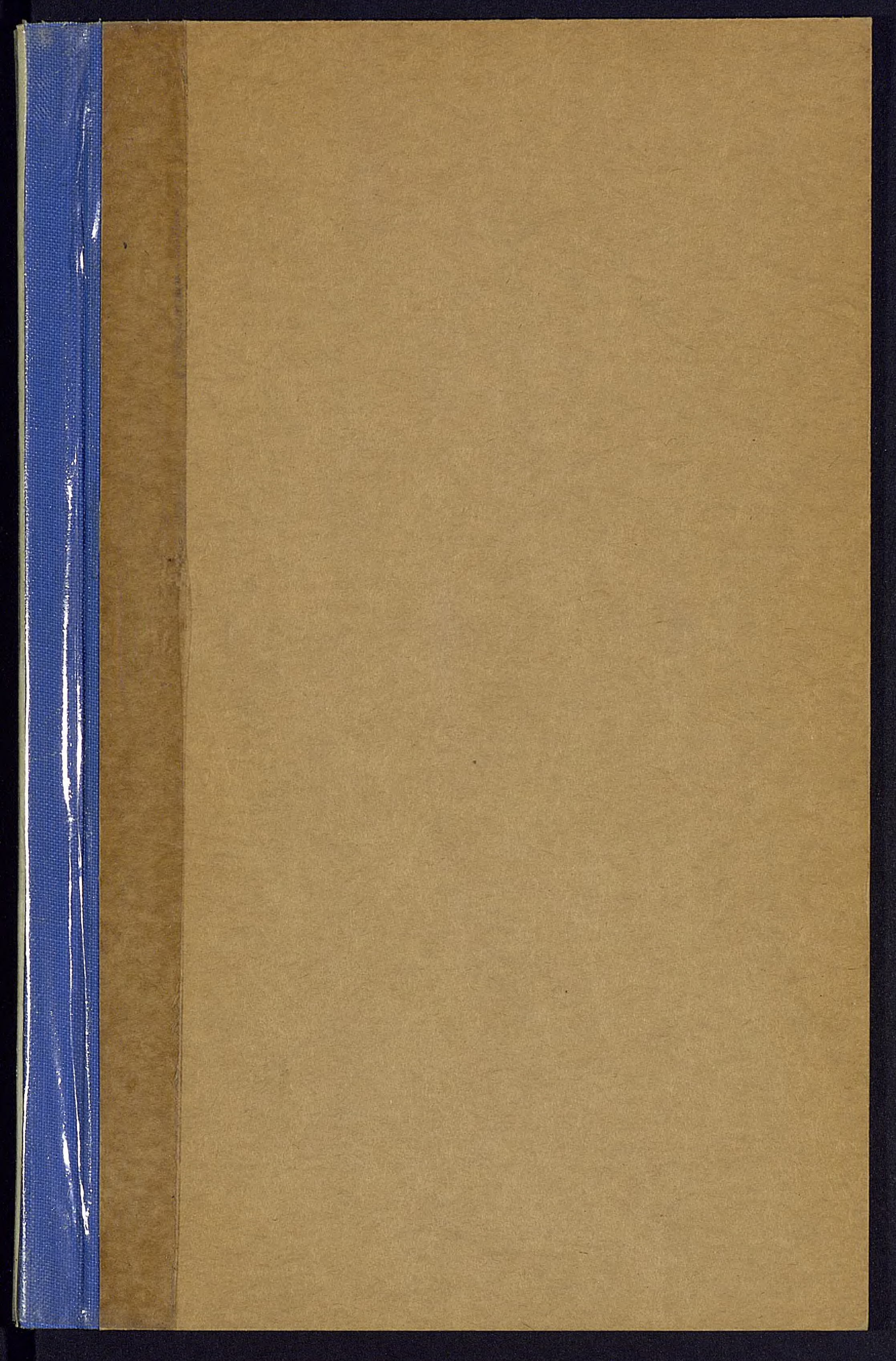
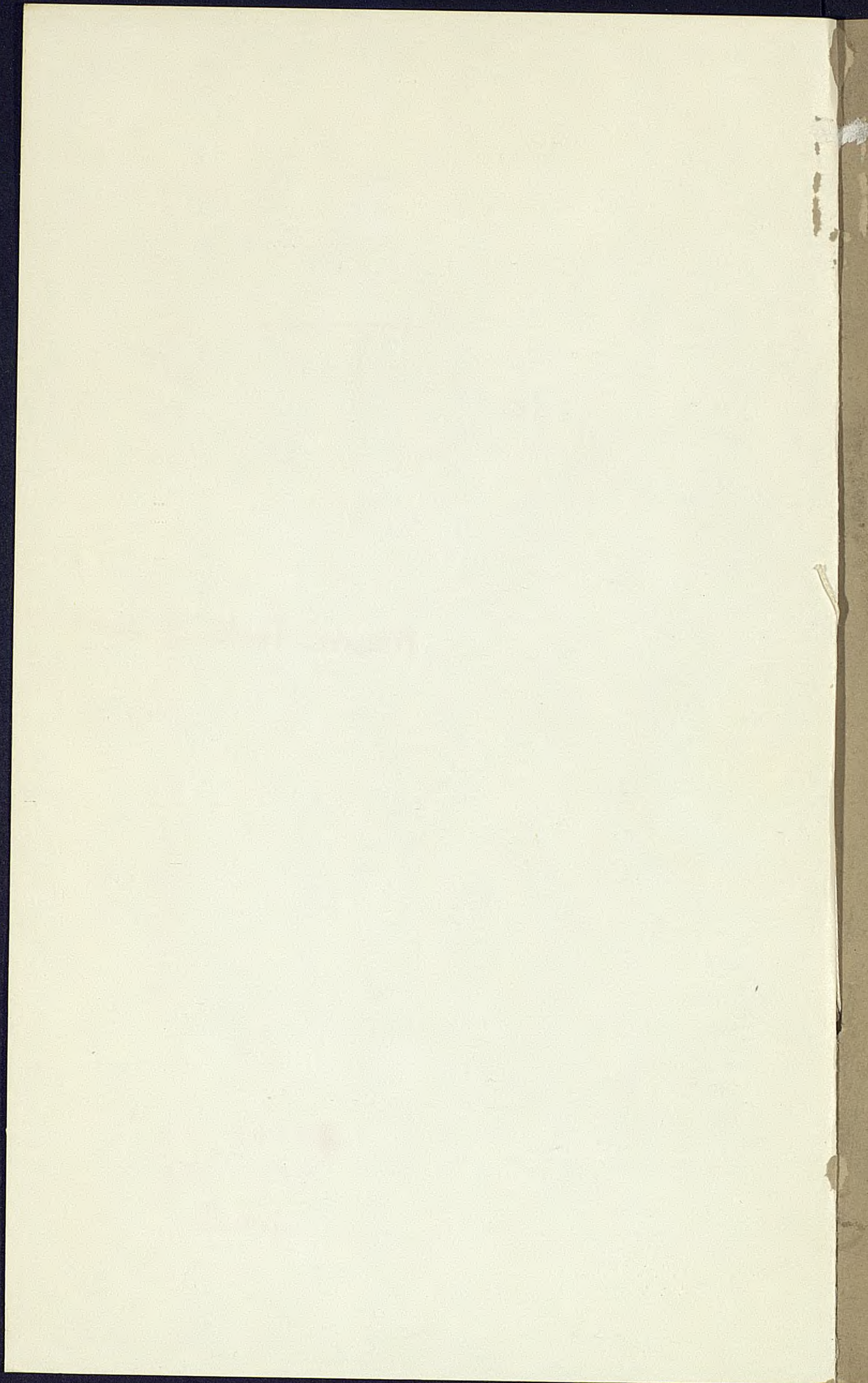




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**FLAX SUPPLY ASSOCIATION
BELFAST.**

INSTRUCTIONS

FOR THE

CULTURE AND PREPARATION OF FLAX

IN IRELAND.



These Instructions can be had gratis, and free by post, on
application to

MICHAEL ANDREWS,
Secretary.

**10, DONEGALL SQUARE WEST,
BELFAST.**

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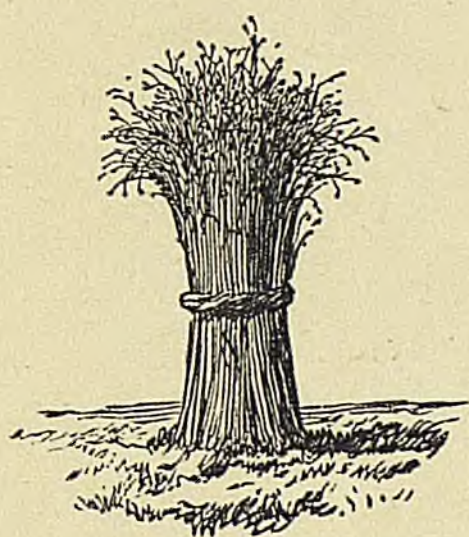
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INSTRUCTIONS
FOR
THE CULTURE AND PREPARATION
OF
FLAX IN IRELAND,

BY
MICHAEL ANDREWS.



SIXTH ISSUE REVISED.

BELFAST:
PUBLISHED BY THE FLAX SUPPLY ASSOCIATION.
1872.



As it is considered expedient to keep these Instructions for the Culture and Preparation of Flax in Ireland in print, this sixth issue, slightly revised, is published for gratuitous distribution.

The revision that is made in each issue does not alter the special directions given in preceding issues, but consists of additional matter derived from current information and from observation.

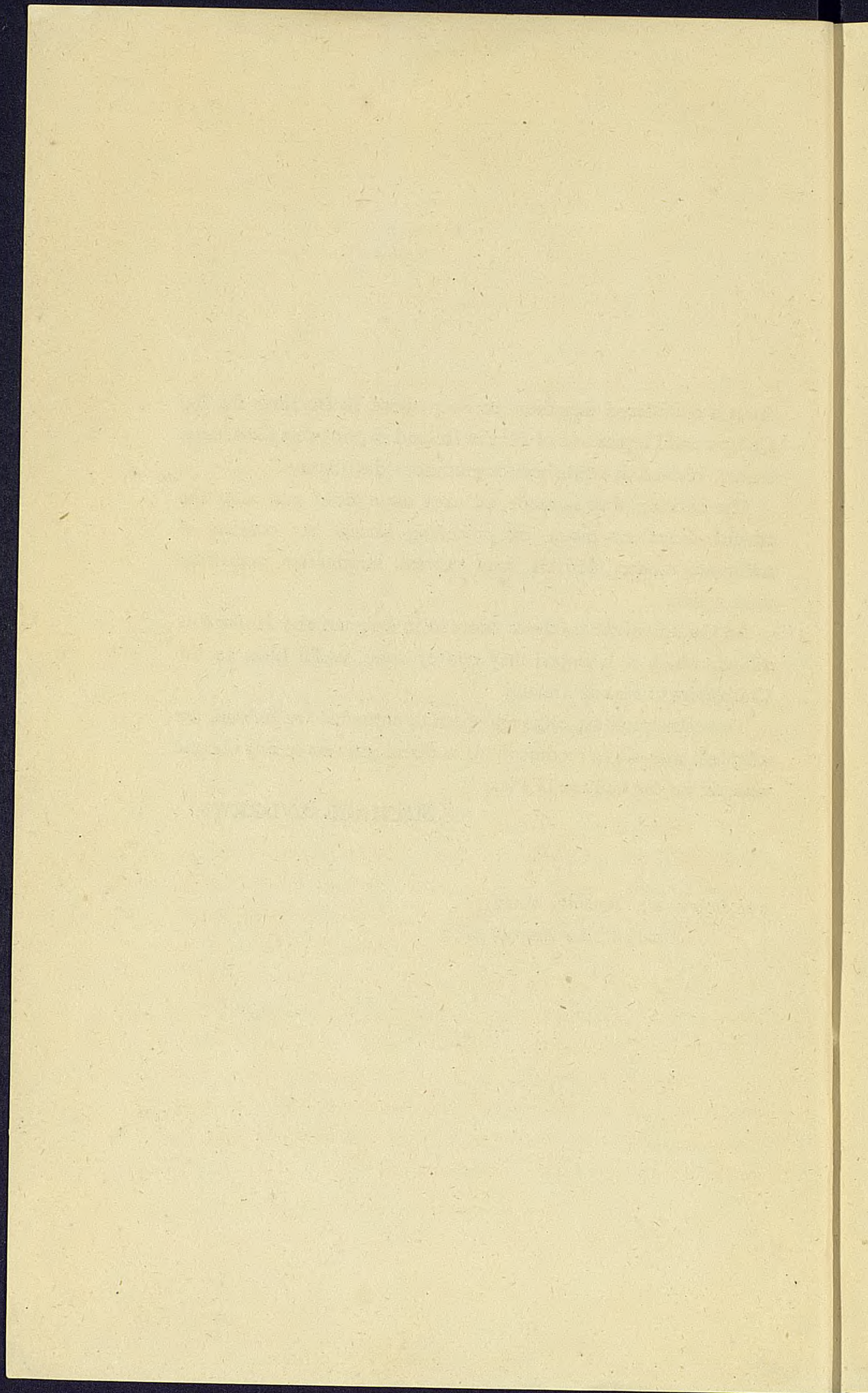
An Outline of the methods adopted in Belgium and Holland is added, which it is hoped may convey some useful hints to the Cultivators of Flax in Ireland.

These Instructions, although specially intended for Ireland, are adapted, with slight modification, to direct growers in any climate suitable for the Culture of Flax.

MICHAEL ANDREWS.

10, DONEGALL SQUARE WEST,

BELFAST, *1st August, 1872.*



INTRODUCTORY.

In preparing the following instructions, on the culture and preparation of flax, my object has been to describe the several operations with such minuteness, and in each language, as to make it comprehensible and available to those classes, engaged in agricultural pursuits, for whom it is specially intended. My design has been to point out a course which, if followed, would make the cultivation and manipulation of the crop less hazardous, not so exhaustive to the soil, more productive, consequently, more remunerative. In former publications I have strongly pointed out that an increased produce per acre is what will stimulate an increased growth of flax; and I am very sanguine that an adherence to the directions I have given would produce this effect.

These instructions are applicable, specially, to the present mode practised almost universally in Ireland, of immediate steeping or retting after pulling. It would be imprudent to endeavour to change, suddenly, the manner the crop has been treated for such a length of time in Ireland; the first object is to obviate defects that exist in the system now pursued and leave it to time to introduce new and improved methods which will undoubtedly follow.

Great advantage will be gained when the practice frequently followed on the Continent can be brought into operation here, viz. 1.—Drying the flax in the field, and stacking it till the following Spring, then when the weather becomes warm enough, retting and graining it; hitherto this system has not been attended with success in Ireland—the obstacles, however, will no doubt yield as more skill is brought into operation.

Ireland has a climate that admirably answers the growth of the plant, but by the time it is ready for the dale the character of the weather has usually changed; chilly nights are not unfrequent, which check the fermentation, and often the process of drying on the grass at so late a season is uncertain and difficult. Flax spreading generally occurs at the time of the equinox; the high winds which prevail at that period do great injury by lifting it off the grass, tossing and scattering it in every direction—I have known crops from this cause almost completely lost. Retting and greasing the same season as grown is always a very hurried business, more particularly, as it occurs just at the time attention must be given to the grain crops. So long as the farmer performs the operations that follow the period when the crop has reached maturity, the present system will be practised, more especially by the small farmers who cannot wait till the following summer for a return from the crop; the day, however, without doubt will come when the farmer's province shall only be to grow the crop, leaving the preparation to others who will pursue it as a separate and distinct industry, and this time will be hastened when the culture shall be improved and more uniformity in the crop attained.

What I have advanced against immediate steeping and greasing may be said to be equally applicable to drying and stacking; the time, however, that would be occupied in steeping will be available for drying. Handling flax straw, as pulled, is very different from handling watered flax: the former will bear a great deal more inclement weather and high winds without material damage than the latter, which is a tender (I was going to say fragile) article, and much more susceptible of injury. At present flax is sometimes dried and stacked in the North, but the adoption of this method will probably be attended with more success in the South, where the better climate will facilitate the operation, and coming

earlier to maturity will enable the drying to be done during a more favorable season.

From a perusal of the instructions that follow it will be perceived, that under the present system, there are so many circumstances over which the grower has no control, that the most practical, skilful, and experienced will frequently be baffled in attaining favorable results; but I am sanguine in time uncertainty will in a great measure disappear. The manipulation subsequent to the crop reaching the stage of maturity will eventually become a separate enterprise, and be attended with results equal in uniformity to what is produced in the majority of other manufacturing processes.

An outline of the methods adopted in Belgium and Holland has been introduced, for the object of stimulating the Irish farmers to emulate the more careful and more successful producers of flax on the Continent.

It has been my aim to treat the subject in a practical manner, avoiding all theoretical and fanciful ideas, describing the various stages connected with the culture and handling of the crop with as much brevity as is consistent with clearness.

Exception will, doubtless, be taken to some points in my instructions—I have, however, given care and consideration to the subject, and I trust my labor may not be in vain.

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INSTRUCTIONS

FOR

THE CULTURE AND PREPARATION

OF

FLAX IN IRELAND.

While every farmer the first consideration should be, is the land he holds suitable to produce a *profitable* crop of flax, and if the facility for watering can conveniently be had? Land intended for flax must be in good condition and clean.

Peaty land, where a clay bottom does not exist, also sandy land with a gravelly bottom are unsuitable for flax, and a small yield and poor fibre may be expected if grown in such soil. Medium and alluvial soils are the most suitable, and on an average of seasons are easily brought into a proper state of tilage to receive the seed. On heavy land, if the season is favorable for pulverising the ground, crops of flax rich in fibre will be produced; of course I assume in all cases, where requisite, the land is properly drained. It is impossible to convey in an instruction such as this a proper idea as to every variety of soil that would be likely to give a good crop, but I may remark that land in "good heart" will produce the best yield, and the fibre will be of superior quality—poor land will produce a weak fibre. In selecting land for flax it is desirable to have it as flat as possible, with a cool bottom—hilly land will not produce flax of a uniform reed.

The next point to decide, and most important, is what extent of the farmer's holding it is proper and judicious for him to devote to flax; this it would be difficult to determine, as much depends on the capability of keeping up the condition. At present one of the most serious defects in Ulster is the small farmers putting in too large a proportion of their holdings. A progressive scale might be adopted, but I admit this question is open to discussion. I would say, on farms up to thirty acres the extent of flax should not

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DISCUSSION
OF FLAX.

exceed 10 per cent., and as the farm increases in size the proportion of flax may be extended, but not greatly in excess of this ratio.

1871-1872.

After potatoes, or old pasture off which one white crop has been taken, a good flax crop may be grown—it too frequently follows wheat or oats grown after green crop the previous year, which only answers when condition is kept up by extra manuring. I shall say little on the too frequent repetition of flax on the same ground, and for this reason, if the proportion I have already pointed out is adhered to, a sufficient interval of necessity will elapse—it should not be repeated more than once in seven years. In the South of Ireland flax is frequently put in lea land, and although heavy crops are often produced it is objectionable; one reason is the difficulty of bringing such land into a proper state of tillage, another is the danger of the cut-worm, which attacks not only flax but corn sown in lea land, and is often a source of much disappointment to the farmer.

In flax culture sufficient importance has not been placed on a judicious rotation, and want of attention in this respect has been to a great degree the cause of the diminution of the yield per acre. Since the acreage under flax has so much increased in Ulster it has become too frequently a stolen or extra crop, without a compensating quantity of manure being given to the land. An examination of the following rotations will illustrate what I mean more clearly. When no flax is grown, the usual four course rotation is pretty generally adopted, viz:—

Potatoes and Turnips,
Wheat laid down in,
Clover and Grass,
Oats.

When flax, however, is grown, the rotation has too often become one of five courses, viz:—

Potatoes and Turnips,
Wheat,
Flax laid down in,
Clover and Grass,
Oats.

This, I confess was my practice, however, I gave additional manure and kept up the condition of the land; in too many cases the manure, instead of being increased, is curtailed—flax only producing money, which is usually spent, *but not on the land.*

The system that will maintain the land in a fertile condition is to adhere to what is commonly called the four course rotation, in which flax would be included; but instead of putting all the land in wheat that had been in green crop the preceding year, I would divide it, say two-fifths in flax and three-fifths in wheat; and by examining the following rotation, it will be seen flax will not be repeated in the same land till after a lapse of nine years.

When turnips and potatoes are both grown, it will also be observed by shifting the side of the field flax will never follow turnips—flax following turnips is considered very objectionable.

YEAR.	CROPS.		
1	TURNIPS.	POTATOES.	
2	WHEAT OR OATS.	FLAX.	1st year.
3	CLOVER AND GRASS.		2nd "
4	GRASS.		3rd "
5	POTATOES.	TURNIPS.	4th "
6	FLAX.	WHEAT OR OATS.	5th "
7	CLOVER AND GRASS.		6th "
8	OATS.		7th "
9	TURNIPS.	POTATOES.	8th "
10	WHEAT OR OATS.	FLAX.	9th "

I have prolonged the rotation to show flax returning to the same land on the ninth year. The above two-fifths allotted to flax would be my ratio of 40 per cent., as a proper proportion of a farm to appropriate to flax; if this system were adopted, there would be fewer impoverished farms in Ulster than there are just now—what really would reinvigorate the growth of this valuable crop, would be to decrease the acreage allotted to wheat and substitute flax.

These observations apply to the North of Ireland, and of course what I advise will require to be modified to suit the various kinds of land, in fact no absolute rule can be laid down, the farmer must exercise his judgment. In the Southern and Western provinces, the small percentage under flax, compared with Ulster, as shown in the Annual Reports of this Association, will make the period distant when it would be necessary to adopt in the South and West what I have recommended. A word of caution, however, to small farmers, even outside of Ulster, as to the too frequent repetition of flax in the same ground may not be unadvisable.

I do not wish it to be supposed that I recommend the rotation mentioned to be adopted without intermission. I know too much



of farming operations not to be aware that ground cropped for a succession of years must have rest. I merely introduce these rotations to exemplify the judicious repetition of crops in ground under cultivation, assuming that a portion of the farm is undergoing the necessary renovation produced by remaining in pasture for some years.

PREPARATION
OF LAND.

Stubble land intended for flax should be ploughed deep in the autumn—if light allow it to remain till seed time; medium may require a second ploughing, which should be done not less than two months before sowing; heavy land will without doubt require the second ploughing and perhaps grubbing to bring it into a proper state—the second ploughing must not be deep, about three or four inches. When flax is intended to be sown in potato ground it must only receive one shallow ploughing, say three to four inches deep; and if the soil is light, this should not be done till a month or six weeks previous to sowing; but if heavy, it would be desirable to have it done earlier, so as to be exposed to the pulverising influence of the frost. When seed time arrives, should weeds, such as docks, stinkard, couch grass, &c., appear, they should be removed, *previous to sowing*, by men with grapes or spades, and children to gather. When this is done, harrow fine; if in ridges, up and down only, if flat, cross harrow also. The reason for not cross harrowing ground in ridges is, it draws mould into the furrows and leaves too loose a bed for the seed in the furrows and brows—flax likes a firm bed. When the land is drained or naturally dry I would recommend flax to be put in flat, which will make the crop more even in length—it is a great matter to have flax as uniform in length as possible—where there are furrows in the field it will grow shorter in the furrows and brows which should be avoided if possible.

PULVERISING.

The extent of pulverising depends on the nature of the soil—on light and medium, excessive pulverising does injury; if it has received a deep ploughing in the autumn and, when necessary, a shallow winter ploughing in addition, a moderate harrowing will leave a sufficient quantity of fine surface mould to give a good bed for the seed. Pulverise such soils to any great depth, and the chance of a good crop of flax is doubtful, unless in an unusually wet season—heavy land, on the contrary, will bear any degree of pulverising.

ROLLING.

After every harrowing pick the land perfectly clean of weeds; remove any loose stones that are large—small stones will do no harm. Previous to sowing, roll once; after rolling some give a single stroke of a seed harrow before sowing—I would recommend sowing on the rolled surface. A dry calm day must be chosen for putting in the seed. Flat ground should be tracked out into lands to guide the sower—this is not to be done with a plough, but the ground merely measured and traced with a man's foot or poles put up. As to the time of sowing much depends on the

Scotland—near the sea coast it will be safe to sow early; inland, too early sowing is hazardous, for fear of late spring frosts which do material damage, frequently causing injury to the tender plant and thereby making it branch, one of the greatest misfortunes that can befall the crop.

The object of early sowing is to have an early pulling, but this is not always attained, as so much depends on the weather during the summer—late sowing will often produce a heavy crop. The largest crop I ever had was sown on the 30th May, and it was ready for pulling nearly as soon as some of my neighbours' flax that was put in much earlier. Notwithstanding the dread of late Spring frost I would, however, advise sowing to be completed before the last week in April, so as to have the flax abroad by the 1st May.

The kind of seed depends on the ground—on heavy soil, or after green crop, Dutch seed would be the most suitable; on light or medium soil, Riga seed will answer best. As to the quantity of seed much depends on the kind sown, quality of seed, and the description of fibre wanted. Dutch seed produces a finer fibre than Riga, but the class is also affected by the quantity sown; thickly sown produces a finer fibre than when sown thin. The tendency in Ireland is to put too little seed in, but the usual moisture of the Irish climate would make it hazardous to sow as thickly as is done on the Continent. Two bushels per statute acre is an average, but a man who understands sowing (and no other should be employed) need not be confined to a specific quantity—experience will have taught him how properly to distribute the seed, having ascertained the wishes of the grower as to the nature of the flax he is desirous to produce. Riga seed should be cleaned with a flax sieve previous to sowing, to get rid of the weed seeds; this will save expense and labour when weeding time comes round—Dutch seed, being much better cleaned, will seldom require this operation. Flax sieves are made expressly for the purpose, of perforated zinc, and can be purchased for 2s 6d each. After being sowed, harrow in with seed harrow; two strokes will usually do.

Ground intended to be laid down in clover and perennial ryegrass should be sown immediately after the flax, and before it is harrowed in. I would particularly recommend that the Italian ryegrass should be sown with flax; its vigorous growth causes it to injure the lower portion of the root of the flax, particularly in wet seasons. If Italian is wanted, let it be sown on the surface after pulling, choosing a wet day.

If dry, roll at once across the field, not up and down—on potato land extra rolling will be required. The best chance for a good crop of flax is rain coming immediately after sowing is completed; it makes a strong and even stand, but if any weak

spots appear, a dressing of soot, or a stimulating artificial manure will much improve it, which should be applied in wet weather. The use of artificial manure in the case of flax is objectionable, unless to invigorate a crop the growth of which is retarded by untoward weather. Farmers should always select land calculated to produce a crop under average circumstances without the aid of stimulating manures—see observations on this subject under the head of Belgium, page 23.

WEEDING.

Weeding should commence as soon as the flax is sown and the weeds begin to appear, and should continue, at intervals, till the crop has attained a height of 4 to 7 inches, pulling the seed weeds and cutting the larger ones that have strong roots. The weeders should have no shoes on, and they must be most careful to tread on the flax as gently as possible, putting down the foot flat and not twisting it on the ground—the crop will quickly recover the effects of careful weeding. After this operation nothing remains to be done till ready for pulling. When the blossom falls and the bolls are formed the crop has attained its height.

I must remark, that if the weather is dry and has been so for some time do not, on any account, attempt to pull the weeds, as it will injure the crop materially by loosening the ground about the root of the tender plant, and cause it to yellow and become sickly, from which it will seldom recover—better allow the crop to remain unweeded; in fact, never weed unless the ground is damp.

PULLING.

When ready for pulling the stalk next the ground will become of a pale yellow, and the leaves will fall off 8 to 10 inches from the ground, and the *top* seed bolls will also assume a *slight* brownish hue; judgment is required—taken too young will make a tender fibre and loss will occur in scutching; allowed to get too ripe will make a dry, coarse flax. Experienced hands should if possible, be procured for pulling—children will not do. The flax is caught a short way below the bolls, and by a dexterous jerk of the arm removed from the soil; laid down in handfuls, as pulled, of a size that can be conveniently grasped, and crossed, so as not to entangle; the butt or root ends to be kept as even as possible.

RIPPLING.

If to be rippled, then carried by children to the ripplers. The rippling comb need not be described, as it can be bought very suitable for the purpose; but I must not omit to say *round* iron for the teeth is much preferable to square, the latter is liable to tear the flax. It should be bolted to a plank, and securely lashed to the body of a cart taken off the wheels, when full, the cart is to be lifted and the wheels to put on, and the bolls removed to where they can be dried; or the rippling comb may be fixed on a frame, if more convenient, and the bolls allowed to fall on the ground or a sheet. In this operation the flax should be handled with care; three or four strokes through the comb will be sufficient; each handful of flax must be held *very* tight, with both

hands, and slightly opened like a fan; the extreme ends should only enter the comb at the first stroke, gradually increasing at each succeeding stroke as far as the bolls extend. As rippled, children cany it to be tied in bolls, which ought to be loose in the hand and small in size; rushes make the best hands, but there is little or no waste using short flax to tie with—it is then ready to cart to the dam. The bolls in the green state should be at once removed and spread on laths, turned frequently, and when partially dry taken to a corn mill and finished on the kiln moderately heated. If the crop is very uneven in length it is desirable to make two pullings, keeping the long and short separate, and steeping each apart.

The dams should be made long before they are required, and dug out of clay if possible. I would recommend a number of moderate sized dams in preference to large ones—nine to twelve feet broad and four feet deep will answer; but the dimensions will vary according to the situation, four feet deep should not, however, be exceeded. Choose a sheltered situation, with an aspect exposed to the sun; make them sound so as to retain the water; and bear in mind, flax water will leak through what will retain clean water. It would be difficult to give the capacity of a dam which would contain the produce of an acre of green flax, so much depends on the crop; a dam, however, about 50 feet long, 5 feet broad, and four feet deep, should contain the produce of a statute acre of an average crop.

WIND AND
WATER.

If the dams are so situated as to allow the water to be run off, fix a pipe in the bottom or side for this purpose. Never use the same water a second time to steep flax in. Soft water is by far the best, however, exposure to the atmosphere will considerably improve water with some degree of hardness. Water impregnated with iron, unless in such quantities as to cause iron rust (this is seldom to be dreaded) should not be rejected if no better is to be had: the presence of iron will not make it hard, the only effect it has is to discolor the flax to some extent, and of course from this cause lessen its value. When a farmer has soil that promises to give a good yield, I would not discourage him from sowing flax because he has no other than water with a tinge of iron in it to steep in. Bog holes used as steeping dams are not objectionable, but should be of old formation, not recently dug out. What *must* be avoided is water largely impregnated with lime, and if no other can be had, I certainly would not advise any farmer to grow flax if he would be obliged to use such water for steeping purposes. An easy test (call it chemical if you will) accessible to every one is—any water in which soap will not curdle is sufficiently soft to steep flax in. But as regards this important matter of water, observation ought to be the guide to a great extent; any farmer, however, having a choice of water on his farm can have it tested,

as to its suitability, by sending specimens to the office of the Flax Supply Association. I would strongly recommend that if new dams are required they should be dug out during winter, and old dams should also, at this season, be cleaned and repaired when required, and the dams filled from surface drainage and kept full till steeping time; if this method were practised there would be fewer complaints of want of water when steeping time arrived.

RETTERING
OR
WINTERING.

The next operation I am about to describe I would call special attention to, as it is by far the most important and delicate process the crop undergoes, and on which the success of it as to quality depends, viz.,—steeping or retting. After the beets have been tied in the manner described, they are carted to the dam. What is pulled each day should be put into the dam the same evening if possible, but never mix one day's pulling with what has been pulled the day previous. Begin at one end of the dam and place the beets in rows close together, side by side, with the root end down; when one row is completed, commence a second, placing the top of the beet about the same of the first row, and so on, row after row, till the dam is full; a layer may be put on the top laying the beets flat. The next thing to be done is to cover the flax with ragwoods (which are only too readily procured) or straw; if boards can be had, it is very desirable to put them on the covering before putting on stones, or sods with the grassy side down, to sink it below the surface of the water. The above is presuming there is already sufficient water in the dam; but if it could be so arranged to have a stock dam situated above the steeping dams, it would be more advantageous to put the flax in dry, and when stoned run the water in. The sooner fermentation commences the better—if the weather has been and is warm it will set in immediately, and will cause the flax to rise and come above the water, it must be well tramped down and more stones put on. When the fermentation subsides, it will sink in the dam; it will then be necessary to remove some of the stones to let it rise to the heat, but never allow it to get above the surface. After a few days, the flax must be examined, and then is the time when judgment is requisite to decide when it is sufficiently watered. Take a beet or two out of different parts of the dam; open and examine. If gilt appears in the middle of the beet, and it feels soft when grasped in the hand, it is an indication that it is nearly ready to "take out." Take three or four reeds, which will be found covered with a greenish slimy substance, and if this can be removed from the surface by *delicately* passing it through the finger and thumb, it is an unmistakable indication that it is in a condition to leave the dam; also bend them *gently* over the fore finger, and should the woody part freely separate from the fibre and start up, it is time to throw it out; the reed must be examined throughout its length, and will be found softer at the root end, but if it

yields to this test in the middle, it may safely be considered watered—try both tests, and examine both coarse and fine reeds; the coarse will “water” before the fine, so an average of condition must be taken. The Dutch test is by taking a reed, and holding 10 inches of the middle of it, and twisting with each hand in the reverse direction, if the fibre separates freely from the core it is considered watered—this is by far the most critical operation in flax manipulation. Flax is more frequently underwatered, calculating on the grass finishing the operation—water well and leave little more than drying necessary on the grass, that is, don’t remove the flax from the dam till the fibre separates easily from the core or woody matter. When you commence to examine, it must be done daily, and as it approaches being finished it should be looked at twice each day. When you are satisfied that it is retted take the stakes off and throw it out on the bank; allow it to drain for an hour or two, and then cart to the spread ground. A prevalent, but very mistaken, idea exists that “hard” flax will yield better at the mill—the reverse is the case—properly handled flax will require less scutching, but the very heavy scutching which is required to clean under-watered flax reduces to low rank of what otherwise would remain flax.

Grassing is the next operation. Grazing or stubbed pasture is best for this purpose; any tall weeds or grass should be cut down with a scythe before spreading. Distribute the beets at convenient distances for the spreaders, who should shake it out thin and evenly in rows across the field, letting the top of each row lap the root end of the preceding one about two inches, which is a great protection if high winds happen when on the grass—some object to overlap it as it has a tendency to entangle in the operation of lifting. Flax is sometimes turned white on the grass, which no doubt is an advantage, but, in my opinion a dangerous operation at the season when flax is spread in Ireland, as it loosens it on the grass, and wind has more power on it; however, if it is to be turned, it must not be overlapped.

An unexperienced hand will feel alarmed on examining his flax the day after it is spread to find it quite “light,” and without much rubbing, the fibre most unwilling to part from the woody core, but if it has been properly watered a day or two will remove all apprehension; it will begin to “bow”—that is, the fibre contracting, leaves the core and forms a string. When this takes place, and a slight rubbing causes the woody core to break and fly off, leaving the fibre entirely, it is ready to lift. Never take flax off the spread, unless on a dry day, nor if the dew is on it. In lifting, great care must be taken to keep the butts or root ends very even. Lay it down in bundles sufficient to make small beets; then tie moderately firm, and stock for a few days if the weather is settled, but if doubtful, carry it to a loft or stack, it being now ready for the scutch-mill.

The foregoing directions as to these very nice operations assume that the weather has been such as is calculated to produce the most favorable results. Suppose the steeping process is approaching its final stage, and the weather appears unsettled, with a falling barometer, I would be inclined to take the flax out of the dam before it was quite ready; it would in this condition (being what is termed somewhat hard) be better able to stand, without injury, unfavorable weather on the grass. On the other hand, had the flax been sufficiently watered before leaving the dam, and got thoroughly dry on the grass, and there appeared an indication of rain, or as occasionally occurs, dry weather should set in with a scorching sun, I would not delay to lift it and put it in stacks, where in a few months, it will attain that condition which a longer time, under favorable circumstances, on the grass would have effected: indeed, it is advisable not to take flax immediately to the mill—stacking will improve it and make it in better condition for scutching. If, as I have frequently seen, a continuance of rain occurs while flax is on the grass, and before it can be got properly dried it will do it much injury, causing it to mildew, more especially when the grass begins to grow up through it. In this case I would recommend it to be lifted in large handfuls, and set up in the shape of a hollow cone. (See Fig. 5, page 26.) In lifting flax, when dry off the grass, it is by gathering the root ends in the hand, but lifted to put in these cones it must be by the *fall* ends, and when formed into the cone, slightly twisted at the top so as to make it stand, and to some extent, prevent wind blowing it down; but from the dread of high winds, caution must be used in adopting this practice.

I must not omit to say a few words on the seed, the supply of which is principally foreign: in this climate home production would be too precarious to depend on. Another consideration to treat flax, so as to save seed suitable for sowing, reduces the quality of the fibre. The saving of seed for sowing, however, is not sufficiently attended to in Ireland, and it would be desirable, that growers of flax should reserve a small portion of each year's crop for seed—of course, assuming that the crop is grown from Riga seed. The portion set apart should be sown rather thinner than that from which no sowing seed is intended to be taken, and allowed to ripen on the foot. Seed must be selected by its appearance, choosing a plump, bright colour, and as free as possible from imperfect pickles; but even with all these characteristics the farmer may not obtain a really good article—the surest method of obtaining genuine seed is to purchase a known brand from a reliable importer.

I have heard it stated that in Belgium seed two years old is preferred, and I think it very likely to be the case. I do not know the vegetating life of flaxseed, but this I know, there are

some seeds which retain vitality for a considerable number of years, and they do not produce their crop in perfection till they have attained some age: the germinating power, however, of old seed should always be tested before being sown.

It may be observed I have said little about the time these several operations require; for this reason, so much depends on the weather and other conditions where *observation can be the only guide*. For example, if the weather is warm, both day and night, during the period of steeping, it will take far less time than under reverse circumstances—flax cannot be watered to advantage when the nights become chilly.

Every farmer should have a barometer, and regulate all his outdoor operations according to its indications—it will prove a faithful friend, and save not only money but a vast amount of anxiety.

The value of the water, as a liquid manure, in which flax has been steeped has been overrated, and I think it is very doubtful if it is worth the cost of pumping and distributing with carts over the land; certainly it is not practicable for the small farmer.

The operation of drying flax in the field for holding over till following summer before being retted, to which allusion is made in the introduction, is seldom done in Ireland unless from necessity. It might be worthy of consideration and experiment whether this process would not be attended with advantage to flax farmers, more especially in Munster. The most approved method is that adopted in Belgium, which will be found pretty fully detailed in page 24. It may be advisable to remark that, when flax is dried and stacked from "necessity," owing to a deficiency of water at retting time, it would be better, even should rain come to fill the ditches, not to disturb it till winter, when a large quantity of seed might be taken off which would be available for sowing, crushing, or feeding purposes, and the flax held over till the following summer and retted when the weather becomes warm. The retting process cannot be performed with advantage late in the season when the nights become chilly, and attempting to handle it under such unfavourable circumstances, would be attended with risk, if not loss.

In the casualty of firing, to which the flax crop is more or less subject as it approaches maturity, particularly the produce from Dutch seed, the stalk becomes spotted with blotches of a dark brown color which have the appearance of what would be produced by fire—hence the term. There is no remedy; but when these spots or blotches appear, the crop must be carefully watched, and if the firing makes rapid progress, the only alternative is to pull at once, even if not ready, and steep immediately.

It would be impossible to convey how the scutching operation should be done to the best advantage; experienced scutchers, with care, will turn out good flax, *provided* it has been properly

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handled by the grower. If care has been taken in the several stages to keep the flax even it will facilitate the scutching—I mean when piled, when tied in beets after being rippled, when spread, when lifted off the grass, and when finally tied in beets for the mill; if this is done it will go even into the rollers, and the streakers, unless very careless, can give it in nice order to the scutchers, who will be enabled to do their work with much less loss than would arise if it arrived at the mill in slovenly made beets. I may further remark that all attempts which have hitherto been made to construct machines, with a view of improving the scutching of flax, have proved defective, and the old system, with some modifications, has been found the most effective. If perfect uniformity in the condition of the straw as it comes from the farmer could be attained, the recently constructed machines would answer and save labor, but the variable state of the flax straw makes the present method more applicable; however the preliminary operation of breaking is likely to undergo much improvement, and when more perfect breaking is attained less scutching will be necessary, which will diminish the waste, so general now, by lessening the quantity of tow produced.

ALSO NOTED.

In Ireland the mode of cleaning flax by hand-scutching is not sufficiently attended to, and the method adopted in some parts of the country of breaking the flax previous to scutching is of the noisiest kind. The pernicious practice of "fire drying" is very detrimental to the quality of the flax, by robbing it of its oily nature and producing a dry harsh fibre. The implements used in Ireland are very inferior to those employed on the Continent, where a large proportion of the flax is manipulated by hand but frequently, previous to being scutched, it is broken by rollers driven by steam power. In districts where hand-scutching is extensively practised in Ireland, I would suggest the use of rollers similar to those used in scutch-mills, which could be driven by horse power, where the farmers could have their flax efficiently broken, and be thus enabled to hand-scutch it without submitting it to the injurious process of fire drying. Belgian and Dutch stocks and handles have been brought to this country by the Flax Supply Association, and can be procured on application.

In entering into all the operations that the flax crop has to undergo, I have found the details more lengthened than I anticipated, and this has arisen in some degree by not only describing them, but dwelling fully upon the reasons why these operations should be performed; and in some cases explaining what would be the effect of adopting a contrary method.

Farmers beyond the limits of Ulster are too apt to depend on others as to how a flax crop should be managed, and are not sufficiently reliant on their own judgment to guide them in the several operations. The growing and handling of a crop of flax

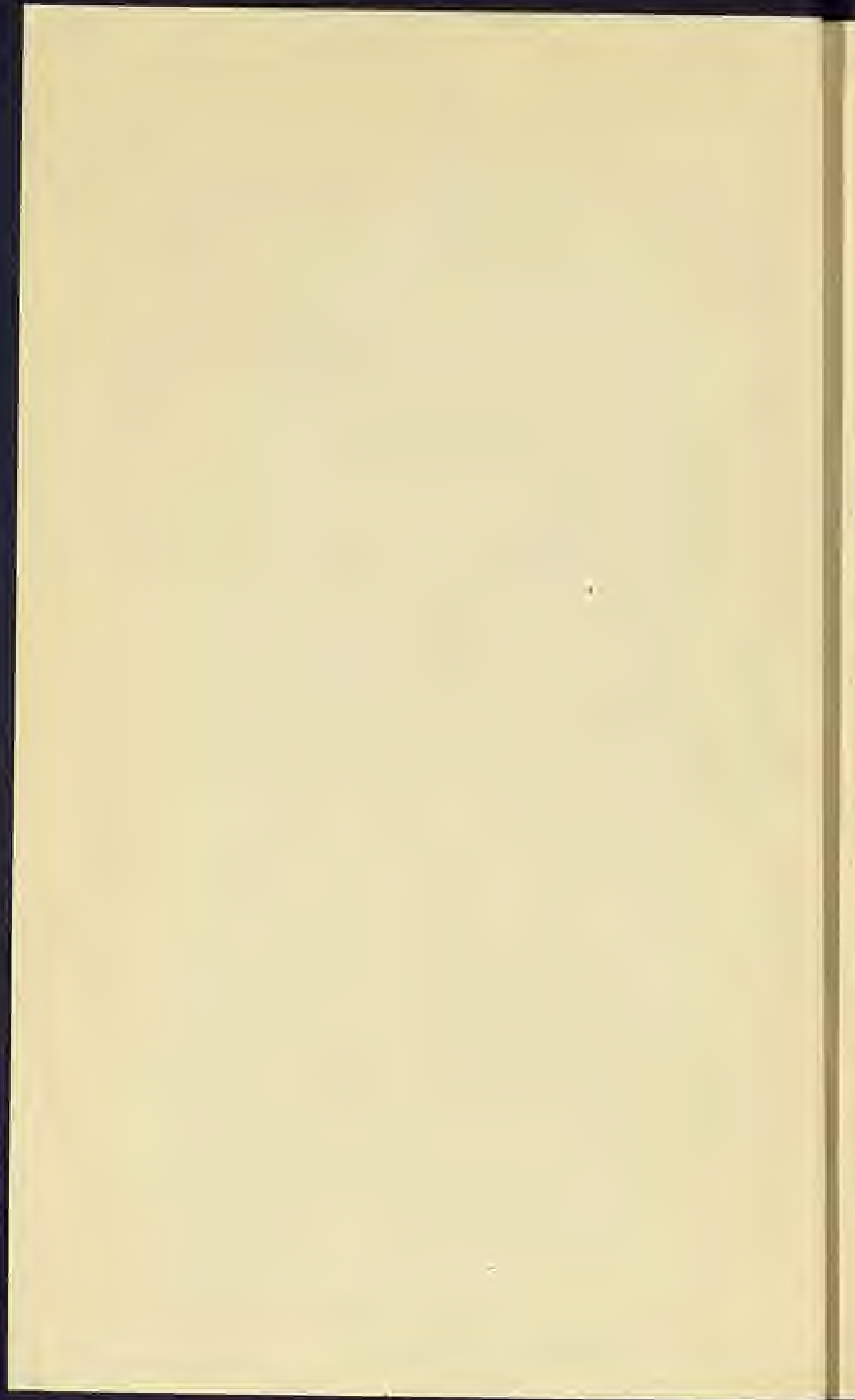
only requires a little more care and attention than *should be* bestowed on a well cultivated crop of oats. The foregoing instructions if followed by any moderately careful farmer, will make him in a short time master of the art (if art it be) of flax culture—a farmer will never gain the requisite knowledge so long as he depends entirely on the supervision of another to direct him—never till the farmers in Connaught, Munster, and Leinster, acquire a habit of independence will they place themselves, as flax growers, in the same position that our Ulster farmers enjoy.

Another consideration which should inspire the Southern farmers with self-confidence, and stimulate them to grow flax, is the advantage possessed by them of soil and climate, which will enable them to produce crops larger in yield, and at a less cost than is done in the North of Ireland.

I have avoided some points that may be considered essential, such as "sub-soiling," but agricultural operations of this nature under existing circumstances, would rarely be attempted by those who produce, in the aggregate, the larger portion of the flax grown in Ireland. Entering into such topics, I consider, would be more adapted to a treatise on general agriculture, but introduced into an instruction solely on the culture and preparation of flax would tend to embarrass and perplex those who may read it.

I now conclude by hoping that those who peruse these pages may obtain some useful hints on the culture and manipulation of flax. My endeavor has been to point out how to attain what is just now so necessary, viz.—an increased yield per acre, and an improved quality of this fibre, which is so indispensable to the staple industry of Ireland.

If these instructions are adopted by farmers in climates where the summer temperature is high, it would be necessary to prevent, as much as possible, the exposure of the straw, after being retted, to the scorching influence of the sun.



CULTURE OF FLAX

IN

BELGIUM, HOLLAND, AND RUSSIA,

AND ITS PREPARATION.

BELGIUM.

To the care with which agricultural pursuits are carried on in Belgium, and the industry of those engaged in the occupation, the large production which is obtained from the soil in that country is to be attributed. On attention to rotation, superior tillage and substantial manuring of the land, depends that success in husbandry for which the Belgian farmer has acquired a world-wide reputation.

On a Belgian farm nothing is wasted, and every corner is occupied by a crop of some kind. In Flanders, farming partakes more of the character of gardening, so neatly is the ground cultivated—special attention being given to the extirpation of weeds.

Land with a North-East aspect is preferred for flax, as in sheltered localities the fibre turns out weak in consequence of the too vigorous growth of the stalk in warm damp weather.

Both white and blue blossom flaxseed is sown in Belgium—the former produces a coarse but abundant and hardy filament, and is principally employed for mixing with hemp—the blue blossom gives a finer, softer, and more valuable fibre.

In the towns the house sewage is all preserved, and sold to the peasants, who convey it in barrels to the country, where it is stored in tanks built of brick, and there remains till required to be applied to the land. Stimulating artificial manures are also used, but it is considered injurious to the quality of the fibre to apply them to flax.

The selection of soil is considered subordinate to good tillage and manuring—sandy and cold clayey soils, however, are unfavorable—the finest and strongest flax is produced on loamy land.

The following is an outline of the methods practised in Belgium:—

In Courtrai, which is famed for the superior quality of its flax, the crop is treated in a manner peculiar to the district, arising from the exceptional method adopted in the retting process in the river Lys, which possesses properties, not known elsewhere, of

producing a fibre, which for its excellence, stands pre-eminent. The Lys is practically a canal, and to the current (which is very slow) the quality of the flax produced is in part to be attributed; but the favorable results attending the operation of steeping flax are owing, in a great measure, to the watchfulness and untiring care of those engaged in the pursuit. The manipulation of the straw in Belgium forms a distinct industry which, of course, ensures more skill being brought into operation—a farmer only rets his own flax when he cannot get what he considers a fair price for it on the foot.

The land is ploughed in October and November, out of corn stubble after potatoes, mangold, or beet. A month or two before sowing time it is dressed with powdered Colza cake and watered with liquid manure, the quantity varying according to the condition of the land. At sowing time the ground is harrowed, rolled, and the seed sown, and then rolled again. Sowing in this country continues from 10th of February till end of March. Seven bushels of seed are sown on one "hectare" or two and a-half statute acres; when it is abundant it considered too thick it is thinned by weeding out some of the flax—on the capability of the land depends the extent to which this thinning is carried.

When weeds appear, and as soon as they can be caught, weeding commences, and the operation is repeated at intervals, so long as it is considered necessary, and if possible, after rain. In light land the flax is rolled by hand labor when it is abundant.

About the 24th of June is the average date when pulling commences. When the seed is fine it is allowed a longer time to ripen than when coarse; and it is pulled, when the finest quality of flax is required, before the seed has sufficiently matured to be suitable for sowing purposes; the pulling is done with extreme care, the root ends kept very even, and as pulled it is laid in handfuls on the ground and stooked the same day, without being tied in beets. The stooks are rather longer than those of grain



Fig. 1.

and are tied at each end to keep them firm. (See Fig. 1.) It remains in the stook till considered dry enough to be tied in beets,

which are built into what are called hedges. The hedges are formed by placing two poles on the ground to keep the flax from the damp; the beets are placed on these poles, row after row, about eight or ten beets high, the tops and butts being reversed in each row—the length of the hedge depends on the quantity of flax; a row of beets, lengthways, is then laid along one edge, and on these another row of beets is laid, with the butt ends resting on them, so as to form a slanting surface, the ends and top are then carefully thatched with straw to protect the flax from the sun and rain. Two poles are driven into the ground, at each end, to



FIG. 1.

support the flax. (Fig. 1. represents how the hedges are built.) It remains in these hedges till dry enough for storing, or stacking (in favorable weather about one month), being occasionally examined to ascertain if it is heating; should this occur, it is taken down and rebuilt; when sufficiently dry it is removed to where it is intended to be stored or stacked, for resting the following spring.



FIG. 2.

Before being rewed, the beets are placed on the floor, and the seed is thrashed out with a flax-shaped mallet (see Fig. 2); sometimes two men are employed, who stand opposite each other and give the flax alternate blows, as in thrashing corn. Two beets are then tied together with three bonds of straw, the butts and tops reversed—these are called bundles, as shown Fig. 4.

The retting takes place in the river Lys, and the bundles are packed in what are called crates, which are constructed of wood. Before putting them in, the crates are lined all round with straw to pre-



Fig. 4.

vent the flax coming into contact with the sides, and also to impede a too forcible current of water flowing through it. The bundles of flax are then packed in the crates in an upright position, and covered with straw. The crates when filled are floated into the river, and kept close to the bank by being tied to stakes; boards are placed on the top of the straw, which are loaded with stones to sink them so as to submerge the flax. After fermentation has set in, the retting process is only allowed to reach a certain stage; the flax is then taken out and set up in hollow



Fig. 5.

cones, which have the appearance of miniature bell tents (See Fig. 5) and dried; it is then again tied in bundles and re-packed in the crates, and put back into the river, where it remains till the retting is considered finished. The usual test of the fibre separating from the woody core is resorted to for the purpose of ascertaining when the time has arrived to remove the flax from the crates; but the experienced Belgian has an additional test by which he judges of the condition of the straw. The fibre is carefully separated from a single straw, and caught about six inches apart, it is then placed close to the ear and gently jerked—it should not break, and if sufficiently retted, the sound should be soft; if not, the sound is of a sharp ringing character—only the most skilful can discriminate the condition by this delicate test.

When considered watered the flax is once more placed in the cones, and remains till the fibre separates from the woody core, then tied in single berts and stored, being ready for scutching. Sometimes a considerable period elapses between the first and second retting operation which is considered favorable for the production of superior fibre. Previous to being scutched, it

is sorted by a competent manipulator—each beet is opened and the flax which is considered in a perfect condition is put aside as suitable for first-class fibre; what is over-watered is also kept by itself to be separately scutched, and what is "hard" is put into bundles and retted a third time. The rettery of M. Casier of Menin was visited by the writer, and he is indebted to this gentleman for valuable information, particularly regarding the double retting process, of which M. Casier was the originator.

In Belgium, flax is scutched both by hand and in mills; the finer qualities are scutched by hand. The mills in Belgium are somewhat similar to those in Ireland, but the handles are of a lighter construction, and from 8 to 10 are attached to each stock; there is also an ingenious contrivance for carrying off the dust which is so objectionable in our Irish mills.

In what are termed the Blue Districts the flax is retted in stagnant water the same season as grown. In some instances, with a view to improve the color, branches of alder are tied in faggots and placed in the ditches a considerable time before steeping season, which are removed before the flax is put in, the leaves being in a decomposed state. The water is then stirred with long poles, to the end of which is attached a flat piece of wood (the water is of a black color), the flax is packed in the ditch in the same manner as practised in Ireland, covered with a heavy coating of straw, on which sods are placed with the grassy side down. When the retting process is completed the flax is spread in the usual manner on the grass.

HOLLAND.

FLAX Farmers in Holland seldom grow flax on their own lands, but rent it from large landholders, and when the latter grow it on their own account they sell it to the flax farmers on the foot.

New land is considered best for flax, after one crop of rye or oats which has been preceded by rape. Flax grown on broken up sea lands is considered a risky crop, but such lands after oats are very favorable for a good crop.

The quantity of seed sown varies according to the quality of seed and of the soil; about 3 bushels per Dutch bunder, equal to $2\frac{1}{2}$ bushels per statute acre, is an average—one-eighth less is put in when home saved seed is used.

When the plants are about half-an-inch above the ground weeding commences, and lasts about six weeks.

The saving or sowing seed being an important item in the crop in Holland the time of pulling is principally regulated by the condition of the seed, which is tested by cutting the capsule across, so as to cover the seed, the section of which should exhibit a compact defined form, and not appear displaced by the action of the

knife. As pulled, it is tied in heets and stood, and remains in the field till sufficiently dry to be conveyed in barges to where



Fig. 4.

it is to undergo the retting process, which is usually at the flax farmer's homestead; it is put into small stacks, or stored in a barn, afterwards tipped, and then retted in stagnant ditches which have been previously cleaned out, the mud from the bottom of the ditches being used as a covering for the flax. The method of performing this operation is much the same as contained in the Instructions, but the grading receives great care; in ordinary weather the flax is spread in the usual manner, but if very wet and broken, it remains in the heets, three of which are placed upright, leaning against each other, to get partially re-dried, after that each heet is cut loose and placed in a cone, as before described in page 26, till sufficiently dry to be stored; flax when spread is always put into these cones for final drying.

In Holland the flax is almost universally scatched by hand, but as in other countries the appliance of machinery to perform the operation is daily attracting more attention, and it is thought the time is not distant when the separation of the fibre will be effected through the agency of machines, of a portable character, or fixed Scotch Mills. It should be remarked that the flax farmers employ breakers moved by steam power, previous to hand scatching.

The main object for introducing this epitome is to bring before the Irish farmers the extreme care and attention which the culture and preparation of flax is considered worthy to receive in Belgium or Holland.

RUSSIA.

With regard to the culture of flax in Russia, it is not intended to enter into the modes adopted in that country, as no utility would arise from doing so. Some interesting information, however, on the subject, has been received from Mr. Edward Cayley, of Omsk, also from a correspondent at Kitz.

The extended scale on which flax is cultivated in Russia, is unequalled in any other country in the world, and the culture of

the crop and preparation of the fibre receives less care than it does in other flax producing countries. The tilling of the land is very rude; weeding, on which such importance is placed in Ireland and on the Continent is never resorted to. Mr. Cayley mentions that the bulk of the sowing seed which is sent to Ireland, is grown on the poorest soil in Russia, and it is found that seed produced on the rich lands to the Southward and Eastward of Moscow yields a flax of a "wretched dwarf growth."

Difficulty is frequently experienced in saving flaxseed in Russia, so as to admit of it being packed in barrels for shipment; it is necessary to have it perfectly dried to enable it to be thrashed out of the bolls; it is also injured by frost if not quite ripe before being pulled, but when rippled it is air-dried which ripens the seed, and so frost will then injure it.

Flax is sown thin in Russia, which partly accounts for the fibre being coarse; the reason for sowing thin is, the flax is less liable to be killed by the very severe thunder storms which so frequently occur about the time it is in flower.

The estimated average yield per acre is under the lowest produce which has been in Ireland during the last twenty years.

Before concluding these brief remarks, it may be mentioned that treatises on the subject of flax have been received from the British Envoys in several flax producing countries; also a pamphlet from the Foreign Office on Flax culture in Russia, Belgium, and Holland. That received from the British Envoy at Brussels, relative to the culture of the crop and its preparation in Belgium is worthy of special reference.*

These treatises contain much interesting information, the foregoing, however, embodies sufficient to enable those engaged in the pursuit of flax culture in Ireland to avail themselves of such hints as they may consider likely to be of a useful character. To place before the Irish farmers too elaborate a detail would defeat the design of this code of instructions, which aims at simplicity in describing the various operations on which the production of superior fibre depends, the intention being only to give such directions as are requisite to assist the judgment of the flax-cultivator—pamphlets are frequently published on the subject of flax, which bear evidence of being compilations, the writers being deficient in personal practical knowledge, introduce technicalities which have the effect of impressing farmers with exaggerated ideas of the difficulties attending flax culture, and so deter many from admitting this profitable branch of agriculture into their rotation.

**Traité de la culture du Lin, et des différentes espèces de soieries. — Par M. Demer.*

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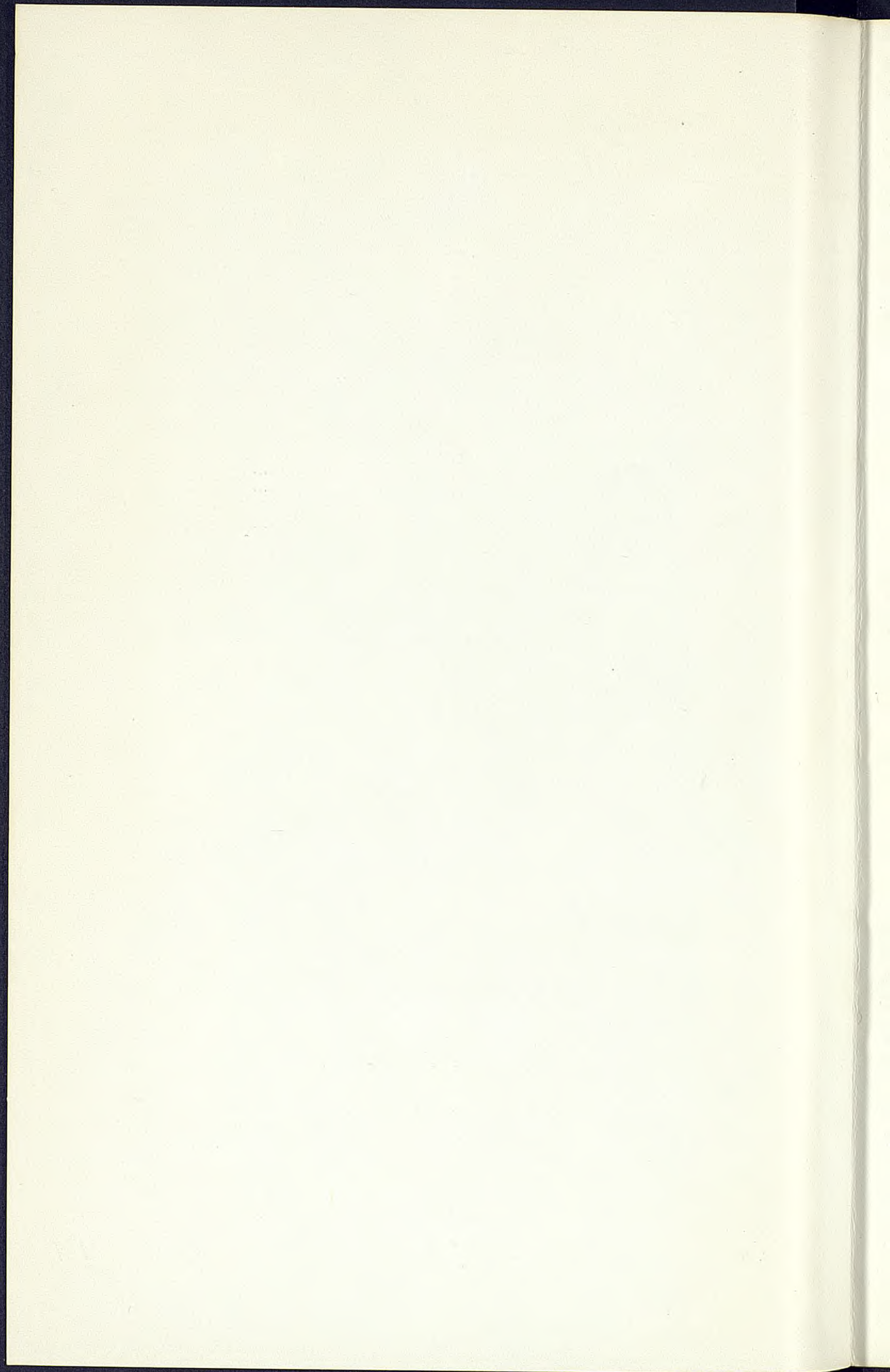
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